co = the area of the stack in square meters, to be determined;

*KI* and *2 = coefficients for velocity at contracted vein and the ratio of the area of the contracted vein to to;
for the case in hand these may be assumed as unity;

$A_a$ir = weight per cubic meter of air; for the case in hand Z = 30° C. (86° R), 1+0^ = 1.110, 1.293-M.110 = 1 kg 165;

$A_g$aa = weight per cubic meter of gases, Ao = l kg 320, * = 630° C. (1166° R), 1+^=3.3121, 1.320-3.312 = 0.399.

The formula may now be written with numerical values, as follows :

$$42.29 = \frac{1X^{1'165}}{19.62X5.10 \quad 0.399}$$

from which w = 3.07, say, 3 $m^2$ 14 (33.10 sq ft), giving a stack diameter of 2 m 00 (6.5 ft).

*t* = average temperature of gases in chimney '600° (1112° F.)

Qo = volume of waste gases at 0° (32° F.)..... 12 $m^3$ 77 451 cu ft

l-j-orf = gas factor for *t°*..... 3.202

$A_0$ = specific weight of waste gases per cubic meter 1 kg 32

Pounds per cubic foot..... 0.0821

Q« = Qo(l+oO -12.77X3.202=..... 40 $m^3$ 89 1440 cu ft

Ai = $A_0$* (1+ofl =1.32-5-3.202 = weight per $m^3$ 0 kg 412

Pounds per cubic foot..... 0.0257

co =area of chimney bore..... 3 $m^2$ 14 33.10 sq ft

Diameter of chimney bore =..... 2 m 00 6.5ft

$v_t$ — average velocity of gases in chimney = 40.89 -?• 3.14= 13 rn 00 per sec 42.8 ft per sec

£air=temperature of external air, assumed to be..... 30° (86° F.)

$A_a$ir = weight per cu m of air at 30° (preceding operation).. 1.165 kg

Pounds per cubic foot..... 0.0725

Aair-$A_g$as = l. 165-0.412 = differential per m… 0 kg 753

Draft depression required at base of stack =…. 42 kg 130

Entry pressure=5.10X0.399 =..... 2 kg 040

Velocity pressure = 5=A^z;$^2$^20) =0.412(13$^2$-*-19.62) = 3 kg 550

47 kg 720

First approximation of height of stack=47.720 ^-0.753 =... 63 m 50 208ft